

Whiners Matter!

Citizen complaints lead to improved regional air quality control

The complaint process often begins with a nose. In 2004, area residents called local agencies on more than 2,000 occasions to complain about offensive odors or other indications of air pollution problems. Although less than 10% of these complaints led directly to enforcement, the data from these citizen alerts is invaluable in identifying trends and problem areas.

For more than half a century, Harris County regulators have investigated and prosecuted air pollution problems reported by citizens. Since the 1970s, City of Houston regulators have done the same, both on their own and under contract with the Texas Commission on Environmental Quality (TCEQ). These officials appreciate that citizens' watchful eyes are essential to air quality control in the Houston area. Citizens not only experience pollution firsthand every day, but also hold the political power to insist on effective regulation by government and diligent compliance by polluting industries.

GHASP recently undertook a review of perhaps the most overlooked component of citizen oversight – complaints. Over the past year, city and county regulators intensified efforts to each strengthen their own air quality programs and to work more effectively together in identifying and addressing regional air pollution problems. GHASP applauds their efforts and looks forward to a more integrated regional approach.

Specifically, Harris County and the City of Houston can build upon each other's strengths and make the most of valuable complaint information by:

- Treating every complaint as a valuable source of information, and using complaint data to identify trends and develop a more cohesive, regional strategy for addressing air pollution;
- Leveraging complementary skills and resources when responding to complaints, so that regardless of jurisdiction, the appropriate expertise and equipment are dispatched for complaint response;

- Standardizing complaint procedures and terminology to the extent necessary to facilitate data sharing and coordination among the agencies, while drawing on the unique strengths of each agency's system;
- Educating citizens on effective complaints, improving call intake procedures, and informing citizens of outcomes; and
- Recruiting and training a network of supplemental investigators, in the community and law enforcement agencies, who can assist with initial data collection in cases where agency staff is unable to get to a location quickly.

Complaint systems play key role in regional air quality control

The region's complaint systems allow Houston area residents to bring odor and air quality problems to the attention of the agencies that have the authority to enforce clean air laws. The city, county and state each have an agency responsible for investigating citizen complaints on air quality problems:

- the City of Houston Department of Health and Human Services Bureau of Air Quality Control (BAQC)
- the Harris County Public Health and Environmental Services Environmental Public Health Division (HCPHES)
- Texas Commission on Environmental Quality (TCEQ) Region 12, covering Harris County and 12 surrounding counties

We found that the overall success of all three complaint systems could be enhanced through better coordination between the agencies and better utilization of the data collected from a complaint. City and county agency staff share information and responsibilities to varying degrees, but a better

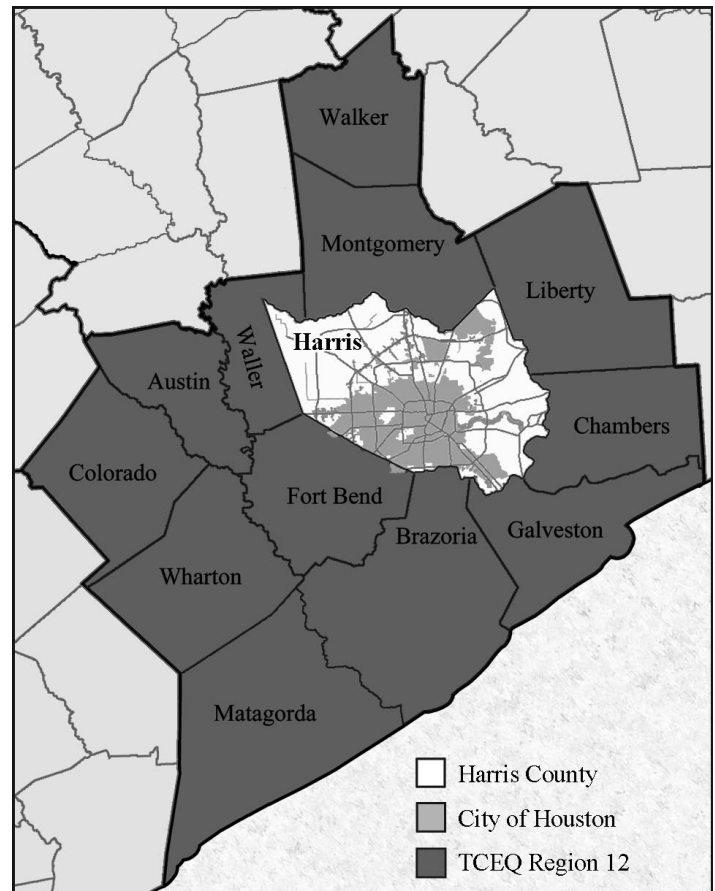
coordinated strategy for responding to complaints would make both agencies more effective. Also, more resources must be dedicated to using the data collected through the complaint investigations to inform the agencies' other investigations, permitting, monitoring and compliance activities.

Truly robust complaint systems can play a vital role in an integrated regional air quality management program. Pollution control agencies can use the systems both to identify violations of state and federal clean air laws and to gather data that is useful in other regulatory activities. By working together more systematically, the city and the county can use data collected through their citizen complaint systems to more effectively identify and address the most significant air quality problems in the region. Effective complaint systems will help agency personnel:

- Identify the source of the odor or other air pollution problem;
- Determine if there is a compliance issue at the source of the problem, and make timely improvements in monitoring emissions from the source facility, when appropriate;
- Deliver prompt enforcement against unlawful nuisances in a manner sufficient to deter future violations;
- Track complaints and enforcement actions in a company's compliance history, and consider this documentation in permitting and penalty calculations;
- Identify and target problem areas and facilities across the region; and
- Build community support for legislators and regulators to take corrective action designed to improve air quality.

Historically, the state has left the bulk of air pollution complaint investigations in Harris County to city and county officials. Until August 31, 2005, the state funded two-thirds of the BAQC's enforcement budget, while the TCEQ's own investigators focused on policing polluters outside the city's jurisdiction.

Map of city, county and state regional air quality jurisdictions



Now the BAQC is operating without the state funds, but with more flexibility to partner with the county in addressing the area's unique pollution control needs.

This report outlines a strategy for the city and the county to more effectively collaborate in deploying their collective resources, particularly their respective citizen complaint systems, to improve local air quality. We spoke with the staff of the TCEQ regional office in preparing this report, and we believe that the TCEQ should play an integral role in the complaint process. However, we chose to focus this report on the two local government agencies that currently have the greatest day-to-day responsibilities for complaint response. As this collaboration begins to show results, GHASP hopes the TCEQ and its state funding will join the city-county partnership and expand this systematic use of citizen complaints in improving air quality to the other counties in Region 12, and even to other at-risk regions throughout the state.

Comparison of city and county complaint systems highlights opportunities

Because of fundamental differences in their historical development, the city and the county have different, yet complementary, approaches to handling citizen complaints. The city focuses on identifying and investigating major air pollution sources and monitoring compliance with regulations. Until recently, it played only a minor role in enforcement, referring most cases to the TCEQ. The county, on the other hand, focuses on protecting property owners from air pollution nuisances, and its investigators actively collaborate with its enforcement staff. However, county investigators will inspect a major facility suspected to be the source of a nuisance and conduct detailed investigations of emission events likely to have a regional impact. The county also comments on some permit applications for major new sources or modifications. The end result is that the city has developed considerable expertise in investigating large-scale pollution problems such as those that originate at industrial facilities, while the county has established an excellent program for investigating, mediating and handling enforcement of neighborhood-scale air pollution problems.

Most citizen air pollution complaints involve a neighborhood-scale odor or dust nuisance, and only a small percentage involve a large facility that is violating a law, regulation or permit governing its polluting activity. Most large-scale violations are discovered by government officials during investigations or regulatory action, rather than as a result of citizen complaints. But though complaints involving major sources are fewer in number, they involve violations that are more likely to have a regional impact or to present an immediate health or safety concern.

If the city's and the county's complaint systems are more closely aligned, the two agencies can leverage their complementary skills to better identify and address both types of air pollution complaints. In the absence of contractual obligations tying the city to state priorities and standards, the city can modify its investigation and enforcement protocols to track the more effective policies and procedures of the county, which are well suited to urban issues. At

the same time, the county can take advantage of the city's more extensive experience with major sources.

A detailed comparison of the two systems highlights opportunities for improvement and integration. Operationally, each system consists of three stages: intake, investigation and enforcement. Ideally, they should also have a fourth stage: trend analysis. While the agencies track some data that can be used to analyze trends, this is an area where the most significant enhancements can be made. If they can systematically combine data collected through the complaint systems, monitoring and other activities, they can more effectively develop solutions to the region's most serious air quality problems.

Step 1: Intake

As the principal contact between concerned citizens and the pollution control agency, call intake is where important data is initially collected. The quantity and quality of information collected during intake has a direct impact on the investigator's ability to conduct a successful investigation. These areas may require particular attention: documenting complaints for accessibility, optimizing response to complaints, and encouraging citizens to participate.

Documenting complaints for accessibility. Intake reflects a delicate balance between standardized and flexible data collection. The city emphasizes quick and easy access to basic complaint information by as broad a staff audience as possible, while the county focuses on immediate and direct access to comprehensive complaint information by investigators.

In the past, the BAQC took calls from the public and was responsible for its own intake system. In 2005, the City of Houston added air complaints to the list of customer service requests handled by its 311 non-emergency call center. Together, the BAQC and Customer Service Requests (311) have developed a template for operators in both departments to use in questioning complainants about the specific characteristics and circumstances of the air pollution problem they are experiencing. As operators interview complainants, they enter the information onto a computerized form that includes space for narrative comments, as well as categorized fields

Type: HLT Air Pollution	Date:	Time:
Either: Street Address of the company producing the pollution OR Street Address where caller observed the pollution.		
Location		
Street #	Dir	Street Name
		Suffix
		Zip Code
1. Does this pollution originate from indoor or outdoor? Indoor - Transfer to Occupational Health: 713-640-4359 Outdoor – "information you provide will be confidential according to the laws that apply."		
2. Name the company / describe the place producing the pollution		
3. What type of air pollution is present?		Other (Describe):
<input type="checkbox"/> Odor <input type="checkbox"/> Smoke <input type="checkbox"/> Dust <input type="checkbox"/> Droplets		
4. What does the air pollution look like?		
5. What does the pollution smell or taste like? (remind you of what?)		
6. Did the pollution affect health or property?		
<input type="checkbox"/> Nose burning <input type="checkbox"/> Breathing trouble <input type="checkbox"/> Headache <input type="checkbox"/> Dizziness <input type="checkbox"/> Nausea <input type="checkbox"/> Other (Describe) <input type="checkbox"/> No Effect Noticed		<input type="checkbox"/> Eyes burning <input type="checkbox"/> Skin burns <input type="checkbox"/> Soot on car <input type="checkbox"/> Car Paint spotty or peeling <input type="checkbox"/> House Paint discolored or peeling <input type="checkbox"/> Grass dead <input type="checkbox"/> Tree dead <input type="checkbox"/> Fish Dead
7. What Day did this begin?		
8. On that day, what Time did this begin?		
9. How often does this occur?		
10. When does it usually occur?		
11. Are you available for an investigator to contact you?		<input type="checkbox"/> Later – not now <input type="checkbox"/> Visit in person <input type="checkbox"/> Telephone call only
Description:		
Participant	Name:	
Customer		Last Name First Name Middle
	Mailing:	Street # Dir Street Name Suffix Additional address info
	ZipCode:	City State Zip Code Phone: Ten-digit Telephone Ext.
	E-Mail:	
Assigned Staff:		

<u>HARRIS COUNTY POLLUTION CONTROL DIVISION COMPLAINT</u>			
DATE:	DAY:	TIME:	BY:
NAME:		PHONE:	
ADDRESS:		ZIP:	PHONE:
REFERRED BY: AGENCY:		PERSON:	
COMPLAINT RECEIVED BY REFERRING AGENCY: DATE:		TIME:	
TYPE OF POLLUTION: WATER: <input type="checkbox"/> AIR: <input type="checkbox"/> SOLID WASTE: <input type="checkbox"/> OTHER: _____			
NATURE: _____		PROPERTY TYPE: _____	
COMPLAINT AND LOCATION: _____ _____ _____ _____ _____ _____ _____			
KEY MAP: _____			
GIVEN TO:	BY:	AT:	DATE:
=====			
INVESTIGATION: DATE: _____		TIME SPAN: FROM: _____ TO: _____	
WIND FROM: _____		SPEED: _____ MPH WEATHER CONDITIONS _____	
COMPLAINANT CONTACTED WITH RESULTS: YES NO DATE: _____ MANNER: _____			
TYPE OF POLLUTION: WATER: <input type="checkbox"/> AIR: <input type="checkbox"/> SOLID WASTE: <input type="checkbox"/> OTHER: _____			
NATURE: _____		PROPERTY TYPE: _____	
SUBJECT OF REPORT: _____			
VIOLATION ALLEGED: _____			
SYNOPSIS OF INVESTIGATION: _____ _____ _____ _____ _____			

The advantage of the city's approach is that it should give investigators more time in the field and more consistent documentation of complaints.

The advantage of the county system is that investigators speak to complainants directly from the beginning, and are not constrained in their information collection by a rigid form. Removing a layer or two of communication may expedite identification of the pollution source. The downside to this approach is that during the intake process, the

investigator may not collect and record, in the agency's standard format, all the data relevant to trend analysis. Therefore, the information may not be easily accessible, if at all, by other agency and enforcement staff. In addition, there is the 24-hour lag time before the available information is entered into the database.

Optimizing response to complaints. Another potential downside to investigators fielding complaints directly is that experienced investigators naturally will note evidence problems with a complaint during the call. While some investigators may still take the opportunity to collect valuable data, others may discourage complainants whose cases are unlikely to lead to an enforcement action. When this happens, the agency misses an opportunity to collect and record timely evidence which could be valuable for future investigations, for deterrence, or for trend analysis.

To prevent such missed opportunities, it is important for investigation and enforcement staff to have regular, direct discussion of actual investigations and enforcement actions. Without this informal, practical exchange of experiences, enforcement staff may not always ask the right questions, even when they have extensive formal training. Meanwhile, investigators tell us that they may be reluctant to comprehensively pursue an investigation that they are not sure will result in enforcement action.

At Harris County, investigators work closely with attorneys responsible for enforcement. However, investigators on occasion may still focus on discovering immediately enforceable violations, at the expense of collecting data for future enforcement action or deterrence. While operating under the state contract, city investigators had little direct communication with TCEQ enforcement staff once they turned a complaint over for enforcement, and were often unhappy with the results.

In general, the extent of an investigation should not be determined by the perceived presence or absence of enforceable violations. Instead, investigators should determine the extent of the problem, and should collect data accordingly. The BAQC is restructuring its investigation protocols, and training its investigators, to focus on identifying and

targeting problem areas and facilities, and establishing the characteristics of the pollution.

Encouraging citizens to participate. A bigger issue facing both agencies may be the perceptions and reactions of the complainants. State law prohibits discharge of "one or more air contaminants, or combination thereof, in such concentration and of such duration as are or may tend to be injurious to or to adversely affect human health or welfare, animal life, vegetation or property, or as to interfere with the normal use and enjoyment of animal life, vegetation, or property." Even with a meritorious complaint of such a nuisance and diligent efforts by the investigator to encourage future complaints, strict legal standards for assessing violations, or problems gathering evidence, may prevent the agency from directly and definitively addressing the complainant's problem. However, the agencies should still follow up with the complainant to explain what actions were taken, and why. GHASP regularly receives calls from complainants frustrated with the lack of follow up, who describe themselves as discouraged from calling the agencies in the future.

For example, in March 2004, a motorist called the county to complain that he was strongly affected by an odor while stopped at a major highway intersection near an industrial facility. The county investigator traced the odor to an operational problem at an upwind wastewater treatment facility. The facility operator agreed to try to reduce the odor, but the county informed the complainant that it could not issue a notice of violation because the odor did not constitute a *nuisance*. That is, the odor did not interfere with the complainant's "normal use and enjoyment of ... property," presumably because the complainant's vehicle constitutes *personal* property, not *real* property.

In its follow-up with the complainant, the agency did not indicate whether it investigated any potential nuisance claim by a real property owner in the vicinity. Also, the agency did not indicate whether or not it inspected the wastewater treatment facility for violations of other air pollution laws or regulations. If the county did not have jurisdiction to investigate further, it could have referred the matter to the city or state agency that had such jurisdiction. In the end,

the complainant wasn't confident that all potential steps had been taken to resolve his concern.

While this particular incident may not have warranted such a thorough investigation, given the agency's limited resources, it does illustrate one complainant's frustration with the follow-up process. When this is the rule, rather than the exception, citizens are discouraged from reporting problems to the agency, rather than motivated to monitor the offending facility's actions more closely and in a manner more likely to provide usable evidence. The agency misses an opportunity to develop and encourage a knowledgeable source for compliance information.

In other cases, the agencies miss the opportunity to collect complaint information altogether. Several investigators told GHASP they believe citizens frequently call the suspected company rather than the environmental agencies if they are concerned about a plant's activities. Anecdotal evidence supports their assessment:

- According to a January 2005 *Houston Chronicle* article, a Valero spokesman acknowledged that the company gets many complaints when it has a release and residents smell something.
- One Deer Park resident interviewed for this report commented that she is more inclined to contact the plant over her local agency because she has found the plant to be a more helpful resource.

Complainants also tell us that they are less likely to make a subsequent complaint to an agency if they feel that a response is not timely or that the investigator has not carefully listened and responded to their specific concerns. At the same time, they tell us they are willing to be more diligent in monitoring polluters and reporting problems, but only if they feel like their efforts will make a difference. These citizens can potentially help agencies by collecting evidence and by increasing public support for legislative and regulatory pollution control measures. Both the city and the county should make a consolidated effort to invite, facilitate and publicly appreciate this type of citizen involvement.

Step 2: Investigation

Both agencies rely upon a dispatched investigator to verify whether an odor or other problem identified in the complaint meets the criteria for a nuisance. Before visiting a site, city investigators call the complainant with any follow-up questions. If the complainant is experiencing nausea or other health problems, the investigator will advise the complainant to get to fresher air, if possible, or even call 911. If a serious regional problem arises, the investigator will dispatch the hazardous materials team. Since county investigators take the complaints directly, presumably these issues are addressed in the initial communication.

Previously, city investigators were trained in the state's investigation method, which requires investigators to use a standardized evaluation of frequency, intensity, duration and offensiveness – known as FIDO – to determine whether an odor is a nuisance. County procedures incorporate all the elements of FIDO. They also provide more detailed procedures for collecting additional information, and county investigators are expected to consider all the information collected, not just the FIDO elements.

The advantage of the TCEQ protocol is that, in theory, it provides more objective parameters for determining what constitutes a nuisance, which should promote consistent enforcement of nuisance prohibitions. The advantage of the county's operating procedure is that it recognizes the inherent subjectivity of any odor evaluation and allows investigators, who have the most direct knowledge of the problem, more flexibility in determining how to proceed. Recently the city has begun implementing a more robust protocol, which it says incorporates best practices from the state, county and other jurisdictions.

An investigation's success depends upon a variety of factors, many of which are beyond the agencies' control. Each investigation is influenced by investigator response time, investigation tools, weather conditions, intensity of the odor and the complainant's allegation of a source. Investigations most often break down when an investigator arrives after



Odors or air pollution problems that originate at large facilities are more likely to have a regional impact.

the odor has dissipated. City and county investigators usually respond to a complaint with a site visit within two hours. However, air is transitory, and many variables affect an investigation. Even if the agency strives to respond to a complaint in less than an hour, the investigator still may not be able to detect the odor, locate the responsible entity or confirm a nuisance condition.

Also, identification of an odor often is inconclusive due to a lack of monitoring equipment. The most widely used tool in investigating an odor complaint is the investigator's nose. County investigators also use a photo ionization detector (PID) to measure the total hydrocarbons in the air. For identification of specific compounds, however, the investigator must anticipate what chemicals may be present and calibrate the PID device accordingly. County investigators sometimes take air samples on site using Summa canisters if they experience a particularly strong odor. However, analysis of Summa canister samples takes time. Therefore, they are not very useful for timely resolution of the problem, though they do provide legally defensible evidence of a potential violation.

Next, the city or county investigator will attempt to trace the odor to a specific facility. If the investigator is successful at locating the responsible facility, the complaint investigation can become a catalyst

for an immediate inspection. The investigator can then document any apparent violations of air, water or solid waste regulations.

Increasingly, city and county authorities are providing a more coordinated response to complaints on the edges of the city's jurisdiction, particularly where a city resident complains of an odor suspected of arising from a source outside the city's jurisdiction. While the county has jurisdiction over more major facilities than the city does, its investigators do not conduct routine compliance investigations at major facilities. The city, on the other hand, has considerable expertise in identifying specific units and malfunctions as the source of an air pollution problem, because of its former partnership with the TCEQ in conducting permitting and periodic compliance audits. An even more formalized joint response to these types of complaints could result in better source identification, and ultimately better pollution control.

After an investigation is complete, the agencies need to follow up with the complainant. The city informs complainants of investigation results with a phone call, followed by a letter and a copy of the investigation report. County investigators note on the complaint form the date and method used to follow-up with the complainant. Follow-up is important because the complainant is more likely to learn of the final resolution of the complaint, and thus be encouraged to call again if experiencing another problem.

Step 3: Enforcement

While the main task for investigators is to determine the nature and source of a complaint, the scope of their duties expands for complaints that warrant enforcement action. Investigators must collect evidence of a violation and information from the source before a confirmed nuisance can be forwarded to the correct department for formal enforcement. If an investigation confirms that an odor complaint is a nuisance condition, or violation of an applicable law or regulation, a Notice of Violation (NOV), which is known at the county as a Violation Notice (VN), will be issued.

Table 1: Complaints represent more than 90% of local government enforcement actions

	Harris County		City of Houston	
	Number	Percent of Complaints	Number	Percent of Complaints
Air Complaints	1360		722	
Air Violations from Complaints	383	28	52	7
Air Enforcement Actions from Complaints	112	8	30	4
Total Air Enforcement Actions	125		NA	

Source: Harris County Environmental Public Health Division and Houston Bureau of Air Quality Control (FY 2004).

In 2004, less than 10% of citizen complaints to the city or the county resulted in an enforcement action (Table 1), which compares favorably to the TCEQ's conversion rate in areas of the state without local air quality programs. However, even when a complaint does not lead directly to enforcement action, it can be a valuable source of data for an agency's other pollution control activities, including monitoring, permitting and planning.

Investigators often have much to add regarding the accuracy of the information collected by those responsible for the enforcement stage. Likewise, data collected during the enforcement stage can be a valuable resource for those investigating the underlying sources of air pollution.

County investigators and attorneys actively exchange information before, during and after an enforcement action. The county usually tries first to obtain voluntary compliance. However, if negotiations fail, it resolves enforcement actions through civil or criminal litigation. The Harris County Enforcement Coordinator reviews all nuisance violations and determines which to forward to its team of county or district attorneys. Enforcement staff may seek temporary and permanent injunctions, which may contain provisions requiring the violator to add pollution controls above what is required by permit. County investigators stay involved in a case by tracking it through the county's enforcement database, Visiflow. County investigators also retain responsibility for monitoring compliance during and following any notices of violation or enforcement actions, including periodic follow-up inspections. The county maintains a database of investigator assignments and timelines for follow-up inspections of facilities cited for violations, and supervises performance of these inspections.

The city's enforcement resources and authority are now quite similar to those of the county. No longer constrained by the TCEQ's enforcement priorities, the city can emulate the county's more proactive approach to enforcement. However, the city does not have access to the county's database, and it may be some time before the city or the county has full access to the state's database, which reflects all state enforcement actions in the region, including those arising from investigations conducted by city staff under contract with the state. Common access to the complaint, investigation and enforcement data by all regional investigation and enforcement staff should make companies' compliance histories more complete, and thus permitting and penalty calculations more consistent and evenhanded.

Step 4: Trend analysis

Both the city and the county track recurring complaints, noncompliant companies and problem areas through their databases or periodic reports, but their systematic analysis capacity is limited.

Presently, HCPHES supervisors use the county's Poll-tracking database system to research patterns that may provide insight on a particular case. However, this system is not fully developed as a tool for pattern recognition. In addition, the county has begun mapping complainant and facility locations through a Geographic Information System (GIS), which should facilitate the identification of problem areas.

Under the state contract, when the city staff wanted to review data, it was generally limited to TCEQ database queries developed for statewide applicability. The state's response to special requests for

data often took months. The city has requested the regional data from the state's database through 2005, and the county is seeking access to the state's database, but the state appears in no hurry to accommodate these requests.

The city is working to develop its own trend analysis capabilities. If and when the city receives 2002-2005 compliance and enforcement data from the state, it plans to use the data to augment its 311 database. In the meantime, the city is continuing to track complaint frequency and use information about recurring complaints (confirmed or unconfirmed) to structure its monthly surveillance program. The BAQC is working with 311 information technology staff to develop a trend analysis and mapping system. Transferring data to the city's mapping software requires careful formatting and attention to detail, and limited resources for mapping affect the pace and scope for this effort.

Together, the city's expertise in compliance investigations of major sources and the county's expertise in prosecuting nuisance actions constitute the expertise necessary to resolve most complaints and to address certain issues at major pollution sources. By pooling resources to track and analyze regional trends, and standardizing investigation and enforcement procedures, the city and the county can more efficiently develop strategies for leveraging their complementary resources to identify, target and resolve air quality problems across the region.

Complaints boost an effective regional monitoring and enforcement program

Citizen complaint systems represent a small component of the region's air quality control system, yet the response and data they provide are essential to attainment of air quality standards. From the citizen's initial call through the analysis of regional trends, complaints provide valuable data for the identification and resolution of air pollution problems.

Any break in the process dilutes the effectiveness of the other components as well. Incomplete communication during intake results in complainant dissatisfaction and ineffective investigations. Ineffective investigation methods mean significant

problems remain undetected longer. Undetected problems delay and complicate implementation of the control measures necessary to address the underlying causes of the region's air pollution. Delayed controls impede meaningful trend analysis, forcing the agencies to focus on reacting to complaints, rather than proactively resolving air pollution problems.

In addition, each stage of the complaint process can suffer from a jurisdictional, rather than a regional, view of the complaint system. The city and county are beginning to collaborate on complaint response particularly in addressing nuisances that cross jurisdictional boundaries, but there are many more opportunities for them to leverage their complementary resources. GHASP recommends that each agency enhance its internal complaint systems with an emphasis on expanded efforts towards a cohesive regional approach to air quality control. Specifically, GHASP recommends that the city and the county:

Build a regional complaint system designed for strategic planning.

The city's and the county's complaint systems should be a shared resource for systematic planning. The county routinely shares information from its database with the city and state agencies, but only as requested, and not in any systematic way. While county personnel can query the Poll-tracking and Visiflow databases, these systems are not set up to detect and alert internal staff and management, much less other agencies, to regional trends or problem areas. Furthermore, there is no formalized regional process for development of strategic responses to emerging concerns. To convert citizen complaints into information that can be used more effectively in strategic planning, GHASP recommends that the city and the county focus on enhancing their internal databases; improving periodic internal reports; and coordinating inter-agency trend analysis through a single office.

Enhancing agency databases. Without access to the state's database, the city needs some electronic mechanism for tracking complaint, investigation, monitoring, enforcement and compliance data on

its own. Recognizing that developing such an information system is a substantial undertaking, particularly now with substantially less state funding, the situation also presents an opportunity to develop an information system that supports regional air quality improvements much more effectively than before.

For example, in developing the database format, the city can consider the county's Poll-tracking system for complaint and investigation data, and Visiflow system for enforcement documentation and tracking. Working closely with the county to standardize data elements will make it easier to import and export data from one system to the other. Using common fields and common terms also will facilitate regional trend analysis and a common understanding between the two agencies concerning issues and problem areas.

While the county has a much more robust and accessible suite of information systems, certain system enhancements can make data analysis and exchange much easier and faster:

- Recording more intake data in categorical fields, as opposed to the investigator's narrative;
- Making data exchange and analysis among the county's systems as seamless as possible; and
- Identifying complainants by tracking numbers as well as their names.

Also, system designers for both agencies should assume that eventually the state will participate in this more cohesive air quality control process. So when enhancing the city's and county's intake and recording processes, every effort should be made to anticipate and accommodate the state's data requirements as well.

Improving internal reports. The enhanced databases should make each agency's periodic internal reporting more relevant to improving air quality. Care must be taken, also, to format these reports in such a way as to make importation into a GIS seamless. Management and individual investigations, alike, could use these monthly reports to:

- Compare the number of complaints and complaint investigations conducted with the number of resulting NOVs and Notices of Enforcement (NOEs);
- Assess the effectiveness of the agency's complaint system as a tool for reducing air pollution; and
- Analyze trends that can inform planning and monitoring strategies.

In addition to helping the agencies allocate resources most effectively, these monthly reports can serve as a basis for explaining the outcome of citizen complaints to the public, especially to those who have submitted complaints.

Coordinating trend analysis. Equally important as internal communications, information sharing and coordinated trend analysis between the city and the county is necessary to identify regional patterns across jurisdictional boundaries. The HCPHES has jurisdiction throughout Harris County, but generally defers to the BAQC within the city limits. When addressing regional air quality problems, however, the value of the data collected does not stop at the agency's jurisdictional boundary. The source of a city resident's odor complaint can easily be a chemical plant just a mile down the street, but outside the city limits. Similarly, a county investigator may identify the source of a nuisance odor, but not have the same technical experience with major sources as the city investigator to collect evidence related to compliance with air pollution regulations.

Systematic analysis of complaint data trends could be used to direct regional planning, as well as each agency's other strategic priorities, such as inspections, routine monitoring, permitting and enforcement. Interagency cooperation is essential for both agencies to maintain a connection with the goals of the complaint system, and to achieve maximum efficacy from the data that complaints provide.

Ultimately, the restructuring of the agencies' complaint systems must lead to interagency collaboration on trend analysis. Presently, the only method for

Table 2: Regional GIS database should reflect standardized data elements

Stationary Elements	Complaint Data
Major sources Monitoring network Schools and outdoor recreation facilities Residential neighborhoods and office parks	Location of experienced problem Location of alleged source Confirmed Approximate location of unconfirmed
Agency Resources	
Agency jurisdictions Location of supplemental resources Special monitoring activities	Nature of odor Frequency Intensity Duration Offensiveness
Enforcement Action	
NOVs or VNs NOEs	Circumstances Time of day Wind direction Flare operation Episodic emissions Traffic
Health Effects	
Complaint Data Research Data Health Reports	

gathering together all the information about complaints from a given part of Harris County is to laboriously review a large number of files at each agency. With an integrated database and enhanced internal reports, the agencies will have the tools to develop a new trend analysis system, helping them to identify where the public perceives problems and determine where to direct monitoring and surveillance efforts. A precedent for this type of interagency collaboration, though it does not incorporate complaint data specifically, is the regional clearinghouse for ambient water monitoring data managed by the Houston-Galveston Area Council (H-GAC).

It should be possible for a single analyst with access to data from both agencies to develop and manage an air complaint clearinghouse. This will require collaboration and an interagency agreement on resource sharing. Because of operational differences between the agencies, however, this regional GIS most likely will operate independently of the agencies' databases, requiring periodic data transmittal. So it is important that the elements of each agency's internal database – and thus, the data collected at the intake, investigation and enforcement stages – be collected in a format that supports each map layer in the GIS (Table 2). The county is further along in implementing its GIS, so it may be in the best position to implement this recommendation

quickly. The county is also a good choice for this function because it has jurisdiction over more of the region's petrochemical facilities. Nevertheless, where this function is located is not as important as ensuring that there is adequate support for staff to conduct high-quality analysis that is of value to management at all interested environmental agencies.

For example, the city can use this GIS data to coordinate its air sampling efforts. The city has obtained funding for a mobile monitoring van and two infrared cameras. The decision to deploy the van to a specific area requires advanced planning, but the van is to be equipped with real-time monitoring tools that can be used in identifying pollutants and tracking them to their source. The interagency GIS system will allow the city to locate areas where the van's real-time air samples will be most effective at helping to resolve recurring air pollution problems.

By coordinating their complaint systems to regularly inform regulatory strategy, the city and county will be better able to accomplish their air pollution reduction goals. The agencies should regard data collected through processing the complaints as useful information that can help them to identify problem areas and repeat offenders, with relevance that continues after individual complaints are resolved.

Table 3: Standardized intake data elements facilitate trend analysis and planning

Complainant	Nature of odor
Name	Frequency
Contact information (phone, email, address)	Intensity
Availability	Duration
	Offensiveness
Location of experienced problem	Form
	Appearance
Location of alleged source	Indoor or outdoor
Confirmed	
Approximate location of unconfirmed	
Evidence	Circumstances
Source (date collected, collector)	Date and time of day
Type	Wind direction
Legal Defensibility (scientific reliability, verification)	Flare operation
Accessibility (where, how, by whom)	Episodic emissions
Findings	Traffic
	Effects on health or personal activity

Optimize available resources necessary for effective investigations.

Even before its contract with the state expired, the city began a comprehensive review of its operations, including the complaint system. With more strategic use of existing resources and development of additional resources, investigators can obtain other essential information during their investigations, leading to a higher rate of complaint confirmations and a greater number of instances where the source of the pollution can be located and addressed. By providing investigators with more complete complaint information, problem-solving flexibility, useful field instrumentation, and backup assistance, investigations will yield better evidence to support corrective action or enforcement, when warranted. To make the most of limited resources, GHASP recommends that the agencies focus on standardizing intake forms and procedures; deploying real-time monitoring equipment; using problem-solving strategies; and supplementing investigation staff.

Standardizing intake forms and procedures. To capture information critical to investigations during intake, the agencies' first contact with the complainant must encourage specificity. Agency websites and outgoing messages from voicemail recorders

can detail the information a citizen will be encouraged to provide with a complaint.

The city operator or county investigator must take care to capture the specific categorical data relevant to trend analysis (Table 3), and the narrative details necessary to identify the problem and source and address the complainants' concern as expeditiously as possible. Carefully designed intake templates and comprehensive training for intake operators and investigators can support these complementary information requirements.

For example, city staff check the TCEQ website daily for emissions events. The investigator uses this information during the intake process to determine whether a complaint reflects an emissions event. If so, the investigator will know to ask appropriate follow-up questions of the complainant.

The investigator's initial communication with the complainant, to the extent possible, should clearly indicate whether the agency will investigate, including any reasons for not investigating. This communication should conclude with an agreement on how to share the results of any investigation or enforcement action, and, to the extent known, protective measures the complainant should take to minimize any adverse effects of the nuisance.

Deploying real-time monitoring technology. Some air toxics monitoring technology allows investigators to identify a wide range of chemicals present in the air within an hour or less. Real-time monitoring technology makes it easier for investigators to locate the source of an odor that may otherwise be too faint or indistinguishable to trace. However, some real-time technology has detection limits that are above odor thresholds. So investigators must make effective use of all the tools at their disposal.

The state and county use PID devices, which can provide some immediate measurements of air pollution. The state recently began using a Cerex monitor and a HAWK camera to identify substantial emissions previously undetected and unreported. So the city has high hopes for the two infrared cameras it is purchasing. The city and county – and ultimately the TCEQ regional office – should identify their collective technology needs and request the funding necessary to supply such technology as standard equipment, so that field investigators are prepared to respond at all times.

Using problem-solving strategies. Neighborhood-scale complaints can often be resolved by an investigator without the need to consider enforcement because they often involve disputes between neighbors or a lack of education about the effect of nuisances. In such situations, it may be best for the investigator to focus on identifying the source, resolving the immediate pollution problem as quickly as possible, and gathering data for use in mitigating, avoiding or preventing the problem in the future. This approach should not preclude the use of enforcement in response to neighborhood-scale nuisances or observed violations, but in the early stages would prioritize problem resolution over evidence gathering and assessment for enforcement purposes.

This protocol will also need to include procedures for quickly identifying incidents that are not appropriate for a problem-solving approach, either due to a more regional impact or due to a serious health or safety concern. While these will likely continue to be a small percentage of the overall complaint caseload, they will be among the most significant. In such cases, the protocol should place greater emphasis on gathering evidence for enforcement.

The county, with its decades of experience in investigating and managing the prosecution of nuisance cases, has been instrumental in the city's development of more flexible protocols. The city is training investigators to prioritize problem resolution, while gathering evidence to use in developing enforcement actions. The city also uses surveillance, community meetings and discussions with suspected sources to identify and prioritize problems.

Supplementing investigation staff. Resources that shorten investigator response time will also improve investigations. More timely responses are the agencies' best means for capturing the complainant's condition, which is impossible to recreate. Because each agency can assign only about ten staff to handle air complaint investigations, the agencies can expand the available response personnel by requesting additional investigators or by using outside investigators to supplement their efforts. Supplemental investigators can respond to a complaint if the agencies' investigators are overburdened or at a significant distance from the complainant's location. While the agencies will still have primary responsibility for conducting complaint investigations, they can incorporate inter-agency referrals, volunteer odor monitors and local law enforcement units into their investigation strategy for backup assistance.

The simplest way for the agencies to reduce response time is to refer investigation responsibilities to another environmental agency when resources are insufficient to assess the odor in an appropriate time frame. The agency with the most appropriate enforcement jurisdiction can assume later phases of an investigation. For example, even though city investigators may not have the authority to enter a suspected facility located outside the city limits, they will still trace a nuisance or obvious flaring problem to its source. When necessary, the two agencies can make investigators available for a joint investigation of a complaint from within the city that potentially involves a source outside the city's jurisdiction.

To make interagency referrals possible, the agencies must use a common set of standards and procedures for evaluating complaints. While under contract with the state, city investigators were

obliged to follow the TCEQ odor protocol, which focuses on evaluating an odor based on its frequency, intensity, duration and offensiveness. County investigators, on the other hand, follow much more detailed guidelines that give the investigator more direction in how to conduct the investigation and more flexibility in evaluating the seriousness of the situation. Because of this greater flexibility to resolve problems, the city has created a more robust protocol that more closely resembles the county procedures, but care must be taken to encourage consistent application and documentation by investigators.

Another way for the agencies to reduce response time is to recruit volunteer odor monitors from high-risk communities where complaints are frequently initiated. A neighborhood volunteer odor monitor has a better chance of gathering essential information while the odor is still present, and can immediately begin evaluating whether a nuisance condition exists and locating the source of the odor. A trained volunteer can provide more useful information than an untrained citizen, and can commence a more timely investigation than an agency investigator. While it is important that an agency investigator conduct the onsite investigation of the potential source and document the nuisance condition for enforcement purposes, the information collected by the volunteer should give the agency a jump start on the formal investigation.

Incorporating informed citizens into the complaint process as volunteer odor monitors will help in other ways, too. These volunteers can make recommendations for improving the complaint intake process, provide citizen-collected evidence that is consistent with agency protocols, and help the agencies establish relationships with critical communities by serving as a point of contact between their fellow citizens and the agency. The agencies would need to allocate resources to establish and maintain a volunteer program. A training program would need to be designed and offered on a routine basis, and staff would need to be assigned to coordinate and communicate with volunteers.

A third strategy for improving response time is for the environmental agencies to formally rely on

local law enforcement units who have received some training in complaint investigation procedures for backup assistance. A police officer in the field might be contacted to respond to an air complaint if he is known to be in the vicinity where the complaint was initiated. This officer would not replace the agency investigator, but rather could arrive at the scene more quickly, making it easier to acquire vital information from the complainant before the odor dissipates. At most, the officer would follow the agency's standard operating procedure to track the odor to its source and inform the source that it is under investigation. This would also give the source an opportunity to identify a problem at its facility and reduce the harmful emissions more quickly. The agency investigator could then meet the officer at the facility to properly complete the onsite investigation. Because agency investigators have the right of entry, they generally must be the ones to investigate the cause of the nuisance at the suspected source and obtain documentation of any violation. City attorneys are reviewing ordinances and researching the differences in parameters and procedures of civil and criminal investigations.

The most appropriate units to involve initially are the Houston Police Department's Environmental Investigations Unit (EIU) and Harris County's Environmental Crimes Unit (ECU), but the practice could be expanded to other agencies. The EIU and ECU, together fielding 17 police officers, constables and trained civilians, primarily investigate complaints on illegal dumping and hazardous materials. Like the proposed volunteer odor monitors, these staff could also be trained to investigate air complaints. The agencies would have to train law enforcement units in the proper method for communicating effectively with the complainant, describing the intensity and offensiveness of the odor, using wind direction to track the odor to its source, and informing the source of the complaint alleged against them. The H-GAC could provide the training on behalf of the agencies through its Environmental Circuit Rider Program, which currently offers general training to local officials on environmental compliance and enforcement, and hosts sponsored workshops for investigators on air sampling.

To implement this procedure, the agencies must develop a system for intake staff to determine whether a member of a cooperating unit is in the vicinity. One advantage of this option over the volunteer odor monitors is that once a member of a law enforcement unit arrives on the scene, he can perform the entire first phase of the investigation before being met by an agency investigator, who would conclude the investigation of the suspected source.

Putting these changes into effect will bring more investigations to a satisfactory resolution, improve communication between the agencies and the public, and promote interagency cooperation. However, they will require allocation of additional resources by environmental agencies, and perhaps by local law enforcement agencies.

Increase public awareness and confidence in the complaint system.

By working to establish relationships with the most at-risk neighborhoods in their jurisdiction, air pollution agencies can more effectively use the complaint system to reduce air pollution. From intake through trend analysis, agencies should publicize themselves as the resource to call for complaints. Community outreach efforts should educate residents on how to report complaints most effectively, and encourage active citizen pollution monitors to share their experience and expertise with their neighbors and communities with similar air quality issues.

Even with more detailed complaints, agencies do not have the resources to investigate every complaint in a timely manner. To better leverage their limited resources, they can take citizen education a step further and facilitate citizen-collected evidence. By synthesizing and simplifying the instructions provided on the TCEQ website and training volunteer odor monitors in at-risk communities, agencies should receive information on air pollution problems not only more quickly, but also in more detail. This additional detail can be invaluable in securing compliance with regulatory and permit requirements, and in identifying problem areas and trends.

The city is developing a formal community training and engagement program designed to help citizens, particularly in at-risk communities:

- Understand available air quality information;
- Identify and collect evidence of specific problems;
- Prioritize the problems they need addressed; and
- Communicate to authorities these problems, priorities and recommendations for more responsive service.

A third way for the agencies to encourage citizen involvement is to communicate the effectiveness of citizen complaints by publicizing those that result in enforcement action and reduced pollution. The place to start is ensuring that investigation and

To report an odor or other air quality problem, contact the agency responsible for the area where the smell is located.

If the problem is in the Houston city limits, call:

City of Houston, Bureau of Air Quality Control

311 or (713) 640-4200

<http://www.houstontx.gov/health/Environmental/airqualitypage.html>

If the problem is in Harris County and outside of Houston, call:

Harris County Environmental Public Health Division

(713) 920-2831

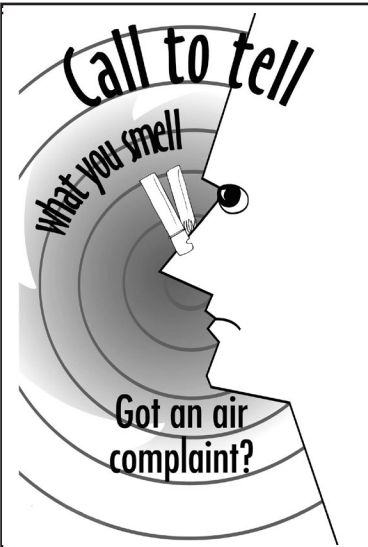
<http://www.hd.co.harris.tx.us/pcd>

If the problem is outside of Harris County, call:

Texas Commission on Environmental Quality

(888) 777-3186

http://www.tceq.state.tx.us/goto/report_problem



enforcement results are reported to every complainant. In addition, the general public can be made aware of effective citizen action through the agencies' websites and targeted articles.

Further, to ensure that as many complaints as possible are tracked, the agencies should require – or at a minimum encourage – companies and other organizations that commonly receive complaints to refer the public to an appropriate agency. We found that citizens often contact the company they believe is causing the problem or an organization such as a Local Emergency Planning Committee. The agencies may encourage complainants to call the suspected source, but typically, complaints made only to industry are not documented or shared with any environmental agency. To ensure that agencies are aware of such calls, companies and public or quasi-public agencies, should be required to periodically report public complaints.

Regional air quality depends on citizen input

Though citizen complaints represent only a small component of the region's air quality control system, effective response to complaints and optimal use of the data they provide are essential to attainment of air quality standards. GHASP believes a more integrated regional strategy for handling this invaluable citizen input will enhance each agency's other efforts as well. GHASP also hopes the state eventually will join in this much needed collaboration. More effective use of complaint systems will improve air quality in surrounding counties, and ultimately across the state.

Key recommendations

In order to enhance their internal complaint systems with an emphasis on expanded efforts towards a cohesive regional approach to air quality control, GHASP recommends that the city and the county:

Build a regional complaint system designed for strategic planning.

- Standardize data elements and data exchange
- Format periodic internal reports for strategic data analysis
- Coordinate interagency trend analysis through a single office
- Anticipate and accommodate state data requirements

Optimize available resources necessary for effective investigations.

- Standardize intake forms and procedures
- Deploy real-time monitoring equipment
- Use problem-solving strategies
- Supplement investigation staff with volunteer odor monitors and local law enforcement units

Increase public awareness and confidence in the complaint system.

- Encourage active citizen pollution monitors to share their experience and expertise
- Synthesize and simplify instructions for effective complaints
- Publicize complaints that result in enforcement action and reduced pollution
- Encourage companies and other organizations that commonly receive complaints to refer the public to an appropriate agency



The Galveston-Houston Association for Smog Prevention (GHASP) works to persuade government and corporate officials to prevent smog. GHASP seeks to accomplish its mission by being the most credible advocate for clean air in the Houston region; by supporting efforts to educate the public; and by directly engaging government officials, community leaders, the media and industry on regional air pollution issues.

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